

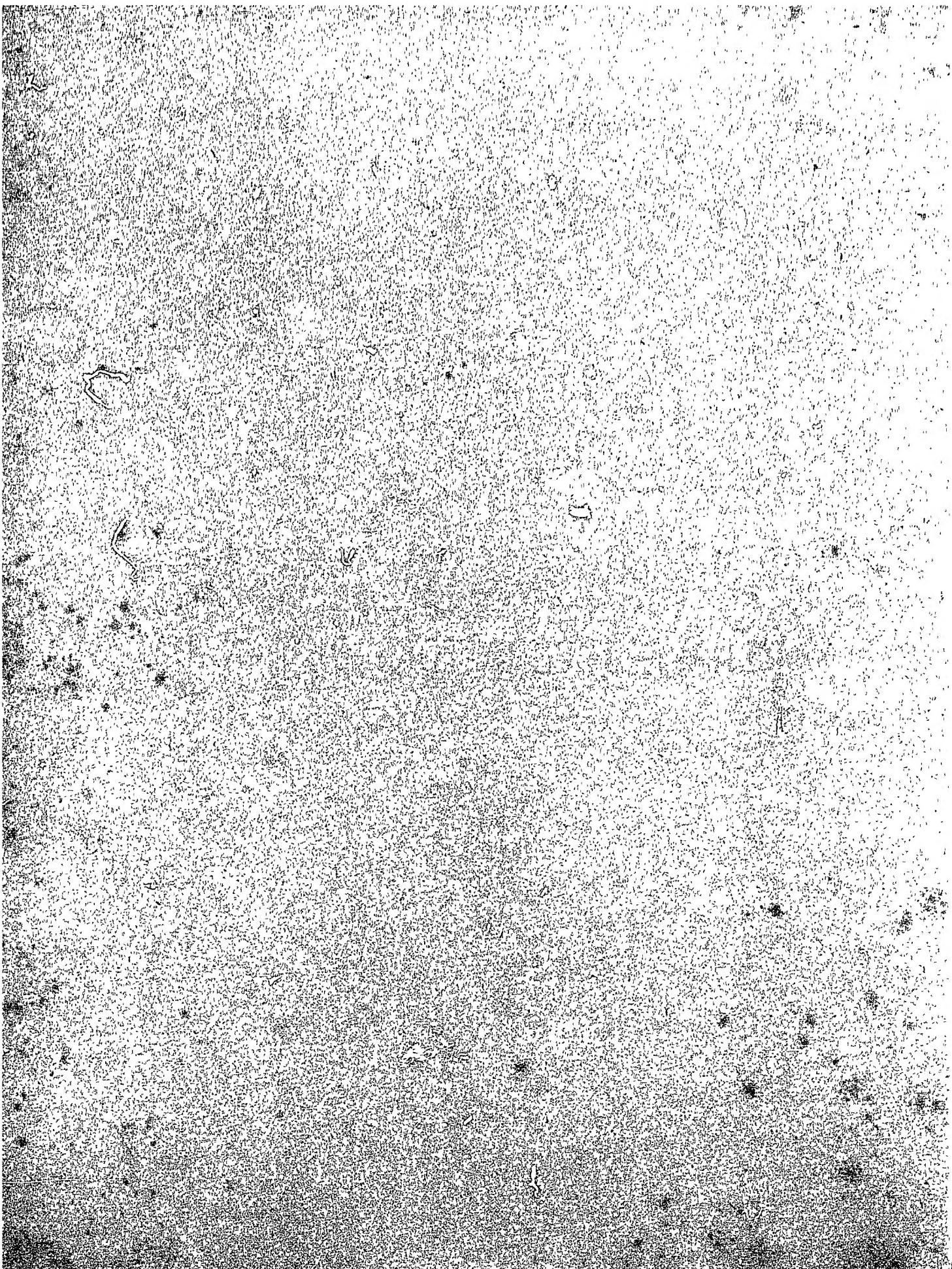
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NORTH-WEST TERRITORY OF CANADA.

Wm. J. Patterson





CONSULAT DES DEUTSCHEN REICHES,
MONTREAL, 14th June, 1881.

SIR,

I have the honour to inform you that I have been requested by the Chancellor of the German Empire, by letter dated Berlin, 27th May, to give full and reliable information regarding the Dominion of Canada.

Knowing as I do that you are in possession of the most reliable data, and that you are at all times anxious to further the interests of Canada, I take the liberty to ask your kind assistance, so as to enable me to send a complete and reliable report. More especially please answer the following questions:—

- I.—Can you give some specific information regarding the Extent, Resources, and Capacity for Settlement, of that region in the Canadian North-West, which is generally alleged to be best adapted for agricultural pursuits, and is commonly designated the "Fertile Belt"?
It would be desirable to include a statement of meteorological and climatic characteristics.
- II.—Do you think the comparatively inexpensive methods presently adopted by farmers in cultivating the lands in the North-West will continue to be effective for many years;—or will they be supplanted by more scientific farming, and the use of improved implements, phosphates, &c.?
- III.—1. What are the prospects for Stock-Raising, as a distinct branch of agricultural enterprise in the Dominion?—and what are the resources upon which the future export trade in Cattle may legitimately hope to draw?
2. Are there any lands, in the older Provinces of the Dominion, adapted for Stock-Raising and Dairy-Farming?
3. Are the climatic conditions more favorable in any one part than another of the Dominion for Stock-Raising?
- IV.—What were the total values of the different kinds of Products exported from Canada to all countries, during each of the past five years?
- V.—What were the principal articles exported during each of the past five years? and what were the differences in values (*increase or decrease*) in the leading articles of export?
- VI.—What do you feel warranted in considering to be the prospects for an enlarged export trade from Canada in the future?
- VII.—What will the probable effect of the building and completion of the Canada Pacific Railway be upon the trade, home and foreign, of the Dominion?
- VIII.—Whether do you think the settlement of the North-West Territory by a numerous population, will increase or lessen the volume of Canadian export trade,—especially in cereals,—to countries in Europe?
- IX.—1. What are the present and prospective means of Internal Communication between the Atlantic sea-board and the interior, for the transportation of passengers and merchandise?
2. Are the rates of inland transportation in favor of the Canadian as against the United States routes to the interior.
- X.—What are the chief difficulties encountered in the navigation of the Gulf and River St. Lawrence?

Awaiting your esteemed reply, I have the honour to be,

SIR,

Your obedient servant,

W.M. J. PATTERSON, Esq.
Secretary Board of Trade,
MONTREAL.

WM. C. MUNDERLOH,
Imperial German Counsl.

OFFICE, BOARD OF TRADE,

MONTREAL, 10th October, 1881.

SIR,

Herewith please receive the Replies to the several Inquiries contained in your letter of 14th June last, which I promised to make with as much care and fulness as possible. Some difficulties incident to obtaining the kind of information which it seemed necessary to furnish, have been the occasion of much longer delay than was anticipated; and I trust this will be accepted as a sufficient apology for what might otherwise look like dilatoriness. The questions have been answered in their order, as given in your communication; and the table of Contents, along with the frequent references which occur from one page to another, will materially assist in ascertaining particulars given under the several headings.

As regards the variety of information adduced in the section entitled "*Climatology of Canada*," permit me to remark here, that there is so much misapprehension, if not misrepresentation, current almost everywhere beyond the limits of the Dominion about its climate, that it seemed necessary to give such a diversity of data as might serve to disabuse the popular mind of its misconceptions in that respect. I feel encouraged to hope, that an examination of the records of meteorological observations given on pages 24 to 29 inclusive, will satisfy candid investigators that the climate of Canada is very far from being either polar or equatorial.

In compiling the information embodied in the following pages, I was compelled to have the "matter put in type," for the purpose of securing accuracy, especially in the numerous tables of figures,—for it seemed as if that could not be satisfactorily attained, had a copy or copies been prepared in manuscript.

Trusting the effort I have made will meet your expectations, and be of service to the Chancellor of the German Empire,—

I am, SIR,

Your obedient servant,

WM. J. PATTERSON,

Secretary.

W. C. MUNDERLOH, ESQ.,
Imperial German Consul,
MONTREAL.

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NORTH-WEST TERRITORY OF CANADA.

I.—EXTENT, RESOURCES, FERTILITY, &c.

I.—Can you give some specific information regarding the extent, resources, and capacity for settlement, of that region in the Canadian North-West, which is generally alleged to be best adapted for agricultural pursuits, and is commonly designated the "Fertile Belt"?

It would be desirable to include a statement of meteorological and climatic characteristics.

INTRODUCTORY AND GENERAL STATEMENTS.

It seems expedient to preface a detailed reply to the foregoing inquiry, by briefly stating a few facts, for the purpose of assisting to form an approximate estimate of the area of the Canadian North-West. The extent of territory included in it, and not yet brought under organized Provincial Government, is reckoned to be considerably more than one million of square miles. This immense region is diversified by numerous great lakes and rivers, by wooded country, as well as by rolling and level prairies. Some of the lakes are as truly "inland seas" as those in Canada and the United States, with which people are well acquainted; while some of the rivers may fairly be classed among those great ones which are described in geographical works.

Of the numerous lakes that might be particularised, Great Bear Lake, N. Lat. 66°, is the largest,—250 miles long, and nearly as many wide,—that is (if these dimensions are correct), it probably covers a larger area than Lake Superior, which has hitherto been considered the largest fresh-water lake in the world, its area being about 33,000 square miles. Great Slave Lake is 300 miles long, by 50 miles wide. Lake Athabaska is 200 miles long, and varies from 20 to 40 miles in width; and Lake Winnipeg is 280 miles long, varying greatly in width, say from 5 to 55 or 57 miles. Respecting the rivers, a few need only be mentioned. The Saskatchewan, Assiniboine, and Red River, empty into Lake Winnipeg; seven or eight rivers of very considerable length discharge into Hudson's Bay; and several flow into the Arctic Ocean. The Mackenzie River is 2,500 miles long, and drains an area of 443,000 square miles. The Saskatchewan River is 1,300 miles long, and drains an area of 343,000 square miles.

There is good authority for the general statement, that the vast territory embraces 600,000 square miles of valuable agricultural land, well adapted for settlement and cultivation,—equal to 384,000,000 acres. It is a misnomer to call this a fertile “belt,” for the rich land, as will by-and-by be shown, does not lie in a single undivided region. It embraces large tracts of vegetable and grass lands; what may be called properly the Wheat land, however, includes several areas, the aggregate of which is about 370,000 square miles, or 236,800,000 acres. The Red River prairie is large and exceedingly valuable. The fertile region in the Saskatchewan Valley, covers an area of 64,400 square miles, (or 41,216,000 acres), in a continuous stretch of about 800 miles in length by 80 miles in width. But by far the greatest Wheat area is beyond the Saskatchewan, in the Valley of the Athabasca, and along the Peace River, westward to the Rocky Mountains, and as far North as the line of 60°. This stretch of country has an area of 470,000 square miles of good land, or about 300,000,000 acres. From the eastern boundary of the North-West to the foot of the Rocky Mountains, there is a gradual rise of 3,500 feet; affording, therefore, not only variety of soil, but appreciable differences of climate, the average temperature moderating as progress is made westward.

As an example of how many people such a country would sustain, take the following:—The population of Germany in 1871 was 42,726,844, spread over an area of 212,091 square miles,—the average being 201 persons to a square mile. To show the capacity of the most fertile part of the North-West to sustain in comfort, if not affluence, an industrious people, it has been computed that there would be plenty of room within the 600,000 square miles first-mentioned for over 120,000,000 inhabitants,—that number being nearly equal to the combined populations of Germany, France, Italy, and Spain, in the year just mentioned. The area of the United Kingdom is only equal to about one-fifth of these fertile lands; while the extent of Germany and France are, respectively, but little more than one-third.

CONFIGURATION AND ADAPTABILITY FOR SETTLEMENT.

The geographical features of a large part of the North-West have been well described by Dr. G. M. Dawson, in his “*Report on the Geology and Resources of the Region in the vicinity of the Forty-Ninth Parallel, from the Lake of the Woods to the Rocky Mountains.*” He states that—

“The central portion of British North America may be regarded as a great shallow trough, of which the western edge is formed by the Rocky Mountain water-shed,—the eastern by that of the Laurentian axis, but of which the western portion of the floor ‘is now more elevated than its eastern rim.’”

The slope is gradually eastward, from the elevated plains lying at the base of the Rocky Mountains; but it descends by two well-marked terraces or escarpments. Dr. Dawson, therefore, divides the region which he describes, lying between the forty-ninth and fifty-fourth degrees of latitude, into three great sections, constituting plateaus or steppes, extending along two lines, which are, in a general way, parallel in a north-westerly and south-easterly course. Of these, the Plateau of the Red River is the lowest; the second and third plateaus, or steppes, rising by successive escarpments. The rise accounted for by these escarpments is, however, but slight compared with that due to the uniform eastward slope, though they are sometimes sufficiently distinct to be locally known as "hills," or even "mountains." The accompanying Map (A) prepared in the Department of the Interior at Ottawa, will aid in comprehending the following greatly abbreviated definitions.

1.—THE PLATEAU OF THE RED RIVER PRAIRIE.

The first steppe, or lowest prairie level, is that of which the southern part lies along the Red River, and which northward embraces Lake Winnipeg and associated lakes, and the flat land surrounding them. The average height above the sea of this plateau is about 800 feet,—the lowest part surrounding the Winnipeg group of lakes, being about 700 feet above the sea-level. The width of this prairie on the forty-ninth parallel is only 52 miles; its area north of that line is estimated at 55,600 square miles,—the lake system covering about 13,300 square miles. A great part of this prairie level is more or less densely wooded. The southern part, extending from the Boundary-line to nearly the south end of Lake Winnipeg, includes the prairie of the Red River Valley, with an area of about 6,900 square miles,—one of the most fertile and accessible regions.

The extreme western margin of the Red River prairie, in the vicinity of the slope of Pembina Mountain, is diversified by groves of oak,—and would, no doubt, be much more extensively wooded, but for the constant recurrence formerly of prairie fires. The settlement of the country will, of course, limit if not prevent their happening in the future.

The uniform fertility of the soil of the Red River Prairie cannot be exaggerated. The surface, to a depth of two to four feet, is a dark mould, composed of the same material as the subsoil, but mingled with much vegetable matter,—the dark color being, doubtless, partly due to a gradual accumulation of charred grasses left by prairie-fires. The soil may be said to be ready for the plough; and in turning the tough thick prairie sod, the first year, a crop of potatoes may be put in, though it is not efficiently broken up until it has been subjected to a Winter's frost. When the sod has rotted, the soil is easily worked and most favorable for agriculture. As regards fertility, Dr. Dawson says:—

"As a measure of the possible agricultural capacity of this great valley, take one-half of the entire area, or 3,400 square miles, or 2,176,000 acres, and, for simplicity of calculation, let it be supposed to be sown entirely in wheat. Then at the rate of 17 bushels per acre,—which, according to Prof. Thomas, is the average yield for Minnesota,—"the crop of the Red River Valley would amount to 40,992,000 bushels."

Much of the fertile portion of this "Plateau of the Red River Prairie," is included in the Province of Manitoba.

For recent evidence respecting the unexampled fertility of the land, see pp. 16 to 19 inclusive.

2.—THE SECOND GREAT PLATEAU.

The second steppe of the plains is bounded on the east, by an irregular line drawn from Pembina Mountain northward along the Riding, Duck, Porcupine and Basquia hills. Its width on the Boundary-line is 250 miles, and on the fifty-fourth parallel perhaps about 200,—or a total area of about 105,000 square miles,—which includes the whole eastern portion of the Great Plains, with an approximate area of 71,300 square miles. The average altitude of this second steppe is about 1,600 feet above sea-level.

The front of the escarpment of the second prairie steppe, as well as its summit, are in some places thickly wooded, and always show extensive patches of timber; and the forest-covered area increases north-westward. While most of the trees now living are small, there are traces of a former heavy forest growth. The great treeless prairie plain of this second division or steppe, is entered upon on crossing the Pembina River. The statement about the soil of the Red River Valley applies equally to this further region. It is fertile, but not so deep or inexhaustible as that of the first steppe, and rests on a gravelly drift sub-soil. In passing westward, the vegetable soil becomes less deep, and somewhat light and sandy,—resting, however, on a good sub-soil of marly drift. Swampy bottoms abound, which bear a good growth of hay-grass; but their area is small as contrasted with the extent of dry ground. The swamps become dry towards the end of Summer,—the natural water supply being thereafter derived from the streams and rivers, which lie in deep valleys, often far apart;—but there will be no difficulty in finding water by sinking wells in any of the lower parts of the prairie. See page 15.

The Turtle Mountain region, which probably covers an area of 300 square miles, is well wooded, and about two-thirds of the forest-growth lies within the Dominion. It cannot fail to be, in the near future, a valuable nucleus for the utilization of the surrounding treeless plains, serving as a source of supply for fuel and building material, and as a refuge for wintering stock, which has been herded over the prairie during the Summer.

3.—THE THIRD PRAIRIE PLATEAU.

The third steppe has a general altitude of about 3,000 feet above the sea, although the eastern edge is sometimes only a little over 2,000 feet, while 4,200 feet is attained at the foot of the Rocky Mountains. The area of this highest steppe is about 134,400 square miles. By far the greater part of the region (say about 114,000 square miles), is almost entirely devoid of forest, the wooded part being confined to a small area near the north Saskatchewan River and its tributaries. The breadth of this steppe, on the forty-ninth parallel, is 465 miles;—its eastern boundary is well marked by the Coteau de Missouri, or Great Coteau, which crosses the Boundary-line near 104° west longitude.

The character of this third steppe is much more varied than that of either of the others; and no part of its southern extent (except the land along the immediate base of the Rocky Mountains) compares favorably with the land of the Red River Valley, or that of the best parts of the second steppe. It appears, however, that the explorations in connection with the Boundary Survey have served to show that, with the exception of a limited area, this country (formerly considered almost absolutely desert), is not of this character; but that a part of it may be of future agricultural importance, and that a great area is well suited for pastoral occupation, and for stock-farming. The fertile region at the base of the Rocky Mountains becomes narrower fifty miles north of the Boundary-line, and then spreads out eastward, (the mountains trending westward), and includes a great area of fertile country in the vicinity of the North Saskatchewan,—the northern position of this region being more than compensated for by its decreased altitude, and the lower and more open mountain-passes to the west. For this part of the country the mountains afford inexhaustible supplies of wood for building purposes, as well as for fuel,—while extensive areas are underlaid by coal. See pp. 20, 21.

RAIN FALL.

Many circumstances must be taken into account in forming a proper estimate of the least amount of rain-fall necessary for the growth of cereals. The distribution of precipitation is, of course, a main point. Ordinarily the rain that falls during Spring and Summer, when crops are in the ground, is of importance; but much depends on the subsoil,—for, where a considerable thickness of porous material is based on impervious rocks or clays, with a nearly horizontal or slightly basin-shaped surface, a portion of the Autumnal and Winter precipitation,—especially the flood-water from melting snow in Spring,—may be counted on. Many considerable areas of prairie country are thus situated,—the general

water level having in some cases been found not far from the surface, even in Autumn, and the moisture rising by capillary attraction, prevents the entire desiccation of surface soil.

It has been estimated by Prof. Thomas, that the rain-fall in the western portion of the (U. S.) plains during Spring and Summer is only 7·34 inches,—a most obvious deficiency, the result in the following States during the same period being,—New York, 23; Cincinnati, O., 25; Missouri, 26; Michigan, 18. The average *rain-fall* at Winnipeg, during three years was 15·96 inches as follows:—

	1872.	1873.	1874.
	Inches	Inches.	Inches
January.....	0·00	0·00	0·00
February.....	0·00	0·00	0·00
March.....	0·25	0·00	0·45
April.....	1·50	0·87	0·02
May.....	3·80	2·38	1·99
June.....	3·80	3·37	4·35
July.....	1·62	3·55	3·07
August.....	1·85	1·17	3·35
September.....	7·25	2·22	1·73
October.....	1·55	0·02	0·04
November.....	0·00	0·00	0·00
December.....	0·00	0·00	0·00
Total Rain-fall.....	21·62	13·58	15·00
Melted Snow.....	8·57	3·51	3·29
Total Precipitation.....	30·19	17·09	18·29

Precipitation in the Red River Valley has seemed to be least near the Boundary-line; for at Pembina a three-years' average is said to have been 13·16 inches. In 1873 it was 14·185 against 17·09 at Winnipeg; while at Fort Abercrombie (180 miles south of the 49th parallel), it was about 15·5, and at Fort Wadsworth (50 miles still further south) 29·45,—the average for five years at the latter place being 18·95, or probably about the same as at Winnipeg.

In brief, it is believed to be the result of experience that the rain-fall of the Red River Valley, supplemented by the water remaining in the soil from Spring floods, is ample for agricultural purposes. There are few regions where ordinary wells, of moderate depth, do not produce plentiful supplies of water. Artesian wells have been successful in past years at Winnipeg,—all tending to show that there need be no apprehension about water-supply. See p. 15.

The rain-fall over a good deal of the second Plateau is supposed to be quite sufficient for agricultural purposes, although it is probably slightly less than that

of the Red River Valley. It seems, however, that vast areas of the Western Plains, south of the fertile portion of the Saskatchewan region, and west of the Missouri Coteau, must remain as pasture grounds, for which, in great part, they are well fitted. But there are indications that the wooded area in the vicinity of Turtle Mountain receives a much more copious rain-fall than the surrounding country.

NOTE.—For tables showing the monthly and annual Rain-fall and Snow-fall at various places in the Dominion,—see pages 24 to 29 inclusive.

WATER SUPPLY.

It is essential to know that a good water supply is easily attainable. As an amplification of the somewhat general statement on page 14, it may be remarked that not only are there numerous rivers, streams and creeks throughout the North-West, but also a large number of lakes and lakelets; and it has been now pretty well established, from actual experience, that good water for household and other purposes, can be obtained wherever explorers have gone, or settlers have located themselves. The following analysis goes far to establish this important point.

Reports received from 140 settlers, show the subjoined results as to the depths at which supplies of good water were found:—

One at a depth of	-	5 feet.	Five at a depth of	-	16 feet.
One	"	6 "	One	"	16 to 20 "
Two	"	7 "	One	"	- 17 "
One	"	8 "	One	"	- 18 "
One	"	8 to 12 "	One	"	18 to 24 "
One	"	9 "	Three	"	- 20 "
Six	"	10 "	One	"	20 to 40 "
One	"	10 to 15 "	One	"	- 22 "
Eight	"	12 "	Two	"	- 24 "
One	"	12 to 14 "	One	"	- 25 "
Two	"	12 to 15 "	One	"	32 to 40 "
Seven	"	14 "	One	"	- 72 "
Four	"	15 "			

Eleven of the reports mention abundant supplies of Spring Water; while many allude to excellent wells, without giving particulars. The last in the above list was artesian.

DEPTH AND QUALITY OF THE PRAIRIE SOIL.

As valuable practical evidence regarding the depth of soil in the prairie regions, it may be stated here that the rich black loam has an extreme variation of from 6 to 8 inches, up to 7, 10, and even 12 feet. Its elements are specially favorable to the production of Wheat,—this fine soil resting on a deep substratum of tenacious clay. An analysis of 146 statements written by farmers and settlers, shows how many varying depths have been reported. Some of these principal depths mentioned were: 6 in. to 14 in.;—1 ft. to 2 ft.;—1 ft. to 6 ft.;—2 ft. to 3 ft.;—2 ft. to 4 ft.;—2 ft. to 7 ft.;—3 ft. to 6 ft.;—3 ft. to 10 ft.;—4 ft. and 5 ft.;—5 ft. to 6 ft.;—and 12 ft. Of the number of statements, seventeen reported depths of 2 ft.; eight, 2 to 3 ft.; five, 2 to 4 ft.; seven, 3 ft.; seven, 3 to 4 ft.; four, 4 ft.; one did not find bottom at 12 ft., while two did not find bottom, but did not state how deep they had gone.

LUXURIANCE OF GRAIN CROPS.*

The following table shows the average yields of particular crops during each of four years, as deduced from statements made by farmers themselves, showing their personal experiences in the North-West:—

	1877.	1878.	1879.	1880.
	Bushels.	Bushels.	Bushels.	Bushels.
Average yield of Wheat, per acre.....	26 $\frac{3}{4}$	26 $\frac{1}{2}$	26 $\frac{3}{4}$	29 $\frac{1}{2}$
" " Peas, "	32	34	32 $\frac{1}{2}$	38 $\frac{1}{2}$
" " Barley, "	40 $\frac{3}{4}$	63	37 $\frac{2}{3}$	41
" " Oats, "	59 $\frac{3}{4}$	59 $\frac{1}{4}$	58	57 $\frac{1}{4}$
" " Rye, "	30	30	40	40
" " Potatoes, "	394	308	302	318

The averages for Wheat were derived from 124 statements; for Peas, from 21 statements; for Barley, from 101 statements; for Oats, from 115 statements; for Rye, 1 statement; and for Potatoes, 92 statements.

* After this section was "put in type," information was received regarding the out-come of the grain crop in Manitoba and the North-West, in the season 1881. The yield of all kinds of cereals is abundant. Returns from 69 districts or parishes, which cover less than one-half of the land at present under cultivation, afford evidence of great crops of Wheat. The yield, according to an average of 49 statements, has been 23 bushels to the acre. One report gives the product as 35 to 40 bushels per acre:—4 give 35 bush., —1 gives 33 bush., —1 gives 31 bush., —15 give 30 bush., —1 gives 28 bush., —17 give 25 bush., —9 give 20 bush., —and 1 gives only 15 bush.

The following comparative figures show the yield per acre of certain kinds of Grain in the Canadian North-West, and the Western and North-Western States:—

	WHEAT.	BARLEY.	OATS.
	Bushels per acre.	Bushels per acre.	Bushels per acre.
Canadian North-West,....	26	40	57
Minnesota.....	17	25	37
Wisconsin.....	13	20	—
Iowa.....	10	22	28
Illinois	8	17	—
Indiana.....	—	19	—
Ohio.....	10	19	23

While these figures are not quoted as from a strictly official source, the subjoined statement is valuable as having been derived from the "*Statistical Abstract of the United States*," published by the Government at Washington, D.C. The period to which it refers consists of ten years, from 1870 to 1879 inclusive,— and the particulars given are, the average annual yield per acre, also the highest and lowest yields, with the years in which they occurred:—

	AVERAGE OF 10 YEARS.	HIGHEST YIELD.	LOWEST YIELD
	Bushels per acre	Bushels per acre	Bushels per acre
Wheat.....	12.04	13.09 in 1877	11.00 in 1875
Indian Corn.....	27.01	30.07 in 1872	20.07 in 1874
Rye.....	14.01	16.00 in 1878	13.00 in 1875
Barley	22.00	24.00 in 1879	19.02 in 1872
Oats.....	28.04	31.07 in 1877	22.00 in 1874
Potatoes.....	87.07	110.05 in 1875	69.09 in 1878

The greatest Wheat-crop in the United States was that of 1880, the yield amounting to 459,657,043 bushels. If only one-twelfth part (30,000 sq. miles) of the good Wheat-lands of the Canadian North-West were under cultivation, and were to yield, (according to the average shown in a preceding table,) 26 bushels per acre, the product of one harvest would be nearly five hundred millions of bushels (499,200,000 bu.), or about forty millions of bushels more than the U.S. crop of 1880.

Referring to the superior quality of Wheat grown in Manitoba, the following statement appeared in the "*Pioneer Press*," of St. Paul, Minnesota, less than a year ago:—

"It seems to be a settled fact that the further north wheat is grown, up to a certain limit, the better it is. The future great wheat region of the world will, undoubtedly be in the rich and far-famed valley of the Saskatchewan, where this grain grows to perfection, not only in quality, but in every other particular. The berry obtains an amber color, rounds out into a fullness which it does not attain here, and is rich in gluten, the life-sustaining principle of flour. Some two or three years ago, samples were procured from several parts of the Province of Manitoba for trial. The best of this was placed in the hands of some of our leading wheat-growers for cultivation. One variety of Scotch Fife yielded the first year at the rate of 37 bushels to the acre, of a hard amber color, which the wheat inspector for the Millers' Association at Minneapolis, pronounced the finest specimen he had seen since he had been connected with the Association.

"Straw stood up stiff and strong, some of it being over five feet high; the heads were long, while the color of the growing grain was superb."

Writing to the same newspaper in relation to the productiveness of the Wheat lands in the Canadian North-West, near the close of 1879, the United States Consul at Winnipeg, (Hon. J. W. Taylor,) said:

"In 1871, Mr. Archibald, the well-known proprietor of the Dundas mills in southern Minnesota, visited Manitoba. He remarked that the spring wheat in his vicinity was deteriorating—softening, and he sought a change of seed, to restore its flinty texture. He timed his visit to Winnipeg with the harvest, and found the quality of grain he desired; but the yield astonished him. "Look," said he, with a head of wheat in his hand, "We have had an excellent harvest in Minnesota, but I never saw more than two well-formed grains in each group or cluster, forming a row, but here the rule is three grains in each cluster. That's the difference between twenty and thirty bushels per acre." More recently, Prof. Macoun, the botanist of the Canadian Pacific Railway Survey, has shown me two heads of wheat, one from Prince Albert, a settlement near the forks of the Saskatchewan, latitude 53 degrees, longitude 106 degrees, and another from Fort Vermillion, on Peace River, latitude 59 degrees, longitude 116 degrees, and from each cluster of the two I separated five well formed grains, with a corresponding length of the head. Here was the perfection of the wheat plant, attained according to the well known physical law, near the most northern limit of its successful growth."

ROOT CROPS AND VEGETABLES.

The yield of root crops in the North-West is simply immense. With the most ordinary cultivation Potatoes give an average of over 300 bushels per acre; Turnips afford 800 to 1000 bushels per acre; Carrots are very large, and Beets promise in the future,—when the Beet-Sugar industry shall come to be developed,—to be a most profitable crop. Cabbages attain an enormous size, and Beans have yielded 60 bushels to the acre.

NATIVE FRUIT, &c.

Very little progress has, of course, been made in fruit culture. The native kinds include Strawberries, Raspberries, Whortleberries, Cranberries, Plums, Black and Red Currants, Blueberries, and Grapes, all of fine flavor, and pronounced to be superior to the cultivated varieties in vogue elsewhere. The pamphlet before referred to says:—

"Doubts have existed as to whether apples can be grown, with any great degree of success in the North-West; but lately the attention of nursery-men in the East has been attracted to this country, and several successful efforts have been made to introduce a variety of plants. There is no reason why apple trees should not be raised in this country, if care is taken at the outset to protect the plants in the Spring; and it has been suggested by a writer that all young apple trees should have a wrapping of straw, so as to protect them in the Spring from alternate thawing and freezing, a great detriment to their growth. It has been proved that apple trees do thrive in this country, and there is ground to believe that the celebrated "Fameuse" of Quebec could be produced."

At a Hudson Bay Co.'s Post as high up as latitude 57° or 59° N., Cucumber-vines raised from seed planted in the open ground in April, yielded ripe fruit on 20th August.

GRASSES AND HAY,—WINTERING OF CATTLE.

The luxuriance of the prairie grasses in the Canadian North-West is a sure indication of the fertility of the soil. The prairie Hay has already become famous, and its nutritious qualities acknowledged on all sides. Stock-raising will, in the near future, rival the production of grain in the fertile land. The Eastern base of the Rocky Mountains, and the Peace River District, especially, will soon become great fields for graziers to carry on an immense business in cattle, the wild grass in those localities being even of better quality than that found on the plains. There are between forty and fifty different varieties of grasses, sedges and legumes in the North-Western prairies. There is in some species, such an abundance of seeds, as to make the fodder partake of the nature of a feed of grain; and it will thus be seen that the tales about the readiness with which stock will fatten on prairie hay are not overdrawn.

A large number of farmers in different parts of the country bear testimony to the plentifullness and nutritious qualities of the native grasses and prairie hay. It has been found by experience that owing to the dryness of the atmosphere, the Winters of the Canadian North-West are really less trying to cattle than in more southern latitudes.

Cattle and horses might be properly stabled, especially during the night, in the more unfavorable regions; and if this were done, and the feeding properly attended to, they would be sure to thrive well. This is amply corroborated by recent testimony of farmers throughout the first and second plateaus. But the old settlers were in the habit of leaving their horses out all Winter, on the prairie, to feed on the grass, which they uncovered by digging away the snow with their fore-feet. See page 31, about stock-raising and wintering cattle.

WOOD FOR BUILDING, FENCING, AND OTHER PURPOSES.

In many of the North-Western Plains there are clumps of wood, and in other parts tracts of forest are so interspersed as to afford good supply to settlers,—while the banks of the numerous rivers are well wooded. Where scarce or entirely absent, Elder, Oak, Elm, hard and soft Maple, and Bass-wood, may be planted and will grow successfully; white Cotton Wood, Poplar and Willow will grow very rapidly, and are most useful for all ordinary purposes on a farm. The native trees are:—Oak, White and Red Cedar, Birch, Poplar, Spruce, White Ash, Cotton Wood, Tamarack, Cherry, White Willow, Balsam Ash, Maple, Pine, Elm, and Box Elder,—the latter being very valuable, as it is coming into use extensively, for the purpose of wood engraving.

An examination of over 130 statements made by farmers and settlers through a wide stretch of country, on the subject of wood supply, shows that only one says, point blank, "wood is scarce,"—another says "wood for building is scarce,"—a number of others state that "wood is plentiful, at convenient distances," and that they use wire-fencing,—many say their wood lots are at varying distances from their farms, say of 2, 3, 5, or more miles, while one expresses his difficulty to be, the drawing of wood from a distance of 15 miles;—another says, "we go 9 miles for our wood,"—nearly all the remainder expressing in varied terms the convenience and plentifullness of the supply.

COAL MEASURES.

One of the greatest of the natural resources of Canada,—perhaps the *most* valuable as regards availability—consists of the immense coal-fields which underlie so large an extent of country in Nova Scotia, on the Atlantic seaboard, and also in British Columbia, on the Pacific coast. If ocean steam navigation is only yet in its infancy, the time may not be far off when it will be economical for the swift fleets traversing the North Atlantic to take coal, going and returning, at ports in

Nova Scotia. The area occupied by rocks of the Carboniferous formation in that Province and New Brunswick is commonly stated to be about 18,000 square miles.

The coals of the North-West Territory are for the most part what are known as brown coals or lignites, and differ, among other respects, from bituminous coals in containing a considerable quantity of hygroscopic water. On going westward towards the Rocky Mountains, however, the proportion of water gradually diminishes, and fuels are found, which are scarcely distinguishable from bituminous coals. This fact is of much significance in connection with the Pacific Railway, the line of which will probably pass close to outcrops of important seams on the North Saskatchewan, Pembina, and McLeod Rivers.

In British Columbia there are valuable deposits of bituminous coal on Vancouver Island, and both bituminous coal and lignite on the mainland. Anthracite is also known to occur on one of the Queen Charlotte Islands. The area occupied by the Productive Coal Measures on Vancouver Island is about 700 square miles, and many of the coals are of excellent quality. On the mainland of British Columbia coals of Tertiary age are found, among other localities, on the North Thompson and Nicola Rivers; and on Hat Creek there is a bed of lignite forty-two feet thick. These localities are not far from the line of the Pacific Railway, and may at some future time supply a portion of the fuel used on that road, although the main supplies will probably be drawn from Vancouver Island and the Saskatchewan region. The limits of the coal and lignite-bearing rocks of the mainland are not as yet defined; but, in addition to tracts of considerable extent in the interior of the Province, they probably underlie an extensive area of country on the lower Fraser and its estuary.

II.—CLIMATOLOGY OF CANADA.

A CURRENT FALLACY.

It has been trenchantly said that the climate of Canada is an "exaggeration," if current statements about it are to be believed ; that is, it is either super-tropical or hyperborean, reminding humanity in Summer of the Equator, and in Winter of the Poles,—without any intermediate alleviation.. A greater fallacy could hardly obtain credence. Standard thermometers show that the Summer means are not excessively high, nor those of Winter unbearably low; though, of course, there are sometimes indications over 90° Fahr. in the shade, and occasional registrations 15° to 25° below zero. On the whole, the climate of the Dominion may fairly be said to be unsurpassed for healthfulness. Without epidemics of any kind, the rate of mortality is lower than that of the United States. While it is fortunate that there are data upon which to rely to substantiate these statements, it is very unfortunate that they should be so generally overlooked or ignored.

CLIMATE OF THE NORTH-WEST.

A pamphlet published by the Department of Agriculture of the Government of Canada, contains the following general statement:—

"The climate is very favourable to the raising of grain and root crops. The spring commences early in April, and the weather, with very little exception, continues fine and dry till the latter part of May. From that time till the end of June it is generally wet; but July, August and September, with the exception of occasional thunder showers, are generally beautiful months, the weather being warm and pleasant. Winter commences in November, sometimes in the early part of the month, sometimes later, and lasts until March. The cold although severe at times, is not so much felt as in the more southern and eastern parts of the continent, owing to the extreme dryness of the atmosphere ; and, in fact, it is a common thing for settlers to describe the winter months in the North-West as the most enjoyable part of the year."

The climatic views in the subjoined paragraphs are gathered, and roughly summarised, from Dr. Dawson's Report :—

With reference to extremes of temperature, in the interior of the Canadian North-West, it would seem that between the Laurentian highlands on the east, and the Rocky Mountains, a great warm Summer wave passes far to the north, reaching the highest latitude near the eastern base of that great range ; while in Winter a compensating and long-continued flood of cold air invades the whole region of the plains, and the eastern and western flanking ranges.

The water-shed between the Red River and the St. Louis, and other streams flowing into Lake Superior, forms a tolerably well-marked climatal line. The influence of the lake and the high wooded ground is a partial barrier to the north-westerly winds, and makes Autumn warmer in the latter region; while in Spring the ice accumulations of the lake, and wooded character of the surrounding country keep the temperature much lower than in the Red River Valley.

As the lowest trough of the interior region of the continent, that Valley seems to serve as a channel for the cold northerly winds in Spring; for, immediately on passing out of it, and up to the level of the second steppe, vegetation becomes slightly but distinctly more advanced. There is sufficient information to prove the remarkably uniform progress of the Spring season along the so-called "Fertile Belt," which, passing north-westward from the Red River Valley, nearly follows the Saskatchewan to the Rocky Mountains.

Parties who have wintered in different parts of this third steppe have stated that the snow-fall is not deep, that it does not lie for more than about three months, and that the temperature is much milder than in localities further east. From the altitude of the country, however, early and late frosts may, agriculturally speaking, possibly shorten the season a little.

As a pastoral and stock-raising country, the higher mean annual temperature gives the third plateau an important advantage over the region to the east of it.

RESULTS OF OBSERVATIONS ON TEMPERATURE, SNOW, AND RAIN-FALL.

While the preceding statements, of a general nature, may be considered conclusive, so far as they go, it is most satisfactory to be able to submit the results of careful scientific observations, which will be found embodied in a very comprehensive series of tables given on pp. 24, 25 and 29. Charles Carpmael, Esq., Superintendent of the Meteorological Service of Canada, has, in the kindest manner, supplied from his office at Toronto, Ont., a number of exceedingly valuable documents, relating to the Meteorology of Canada, covering a period of over forty years. The tables referred to show the highest, lowest, and mean monthly and yearly temperatures, embracing observations made regularly at many prominent places throughout the Dominion;—also, the snow and rain-falls, giving the number of days per annum on which they occurred,—besides a large number of periodical events as they happened at the Cities of Montreal

and Toronto. All that information was prepared under Mr. Carpmael's direction, and its use here was suggested in the correspondence with which the Respondent has been favored.

The tables on pp. 26, 27 and 28 relate exclusively to Montreal, and show the comparative temperature, rain, and snow-fall, by monthly and annual means during six years, from 1875 to 1880 inclusive. There are also two columns with the mean temperature and rain-fall monthly and annually for the years 1860 and 1861. The information was specially furnished for use here by Mr. McLeod, Superintendent of McGill College Observatory.

Mean Temperature (in degrees Fahr.) for each Month and for the Year in the several Provinces, and for certain Stations in the Dominion of Canada.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Ontario.....	19·3	20·2	20·7	42·0	51·4	63·6	69·8	68·1	68·6	47·4	33·0	20·5	43·8
Quebec.....	13·6	15·0	25·3	41·8	54·0	66·0	70·2	68·1	68·7	47·0	33·1	17·1	42·0
New Brunswick.....	10·1	18·1	26·4	37·6	40·4	67·7	62·8	61·4	54·2	45·1	32·3	19·8	30·0
Nova Scotia.....	22·3	21·2	20·7	35·0	41·0	60·6	63·3	62·0	54·0	48·2	30·5	25·5	41·7
Prince Edward Island.....	20·5	14·7	27·6	33·1	40·2	64·0	61·3	62·7	67·2	49·4	32·7	22·0	40·5
Manitoba.....	2·9	3·0	0·0	30·2	51·2	63·0	65·9	64·8	61·3	40·0	11·6	0·6	32·0
British Columbia.....	22·8	28·8	40·8	51·9	50·9	64·5	72·2	70·7	61·4	43·3	30·0	24·5	45·1
Newfoundland.....	25·0	22·7	28·7	33·3	43·0	50·7	60·3	60·1	55·8	49·6	38·0	23·0	41·4
Toronto.....	22·0	22·0	20·3	41·0	51·7	61·7	67·4	66·2	58·1	45·0	30·2	25·7	44·1
Montreal.....	10·8	18·6	20·9	43·5	67·2	66·4	72·2	69·8	60·8	45·7	33·0	18·0	44·3
S. J. John, N.B.....	18·4	21·4	27·8	38·2	46·7	54·7	50·7	50·5	54·6	45·0	35·7	22·8	40·3
Halifax.....	22·0	23·7	28·1	33·1	47·4	50·7	63·5	63·3	57·4	49·3	37·8	25·8	43·1

*Averages of the Highest Temperatures in each Month and Year for various places
in the Dominion of Canada from three or more years.*

*Averages of the Lowest Temperature in each Month and Year for various places
in the Dominion of Canada from three or more years.*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
ONTARIO.													
Toronto	- 9·1	- 7·4	2·4	10·2	20·0	30·3	30·4	31·4	31·3	24·9	14·8	9·7	- 12·1
Goderich	- 1·3	- 1·1	2·1	21·0	29·3	30·1	40·4	44·5	30·3	28·8	13·9	- 2·9	- 8·8
Woodstock	- 7·0	- 13·0	5·2	22·2	28·5	30·0	42·2	44·1	29·0	20·2	1·1	- 15·6	- 14·2
Peterborough	- 20·7	- 15·5	- 11·1	10·3	27·1	30·7	43·2	30·7	28·2	16·3	1·0	- 22·8	- 21·9
Pembroke	- 32·7	- 20·5	23·2	11·0	20·8	30·1	44·4	37·8	30·0	20·3	0·0	- 20·8	- 37·3
QUEBEC													
Montreal	- 18·2	- 12·2	- 0·5	27·4	37·2	40·7	53·4	52·0	41·2	28·0	- 3·5	- 12·9	- 17·2
Quebec	- 20·3	- 17·8	- 8·9	17·6	30·0	42·2	40·0	45·5	30·4	25·0	3·4	- 10·8	- 21·6
NEW BRUNSWICK.													
St. John	- 11·0	- 6·4	1·2	20·2	31·8	43·0	40·0	48·4	41·0	25·0	12·8	- 5·8	- 10·6
Bass River	- 20·2	- 15·2	- 3·4	17·4	25·4	40·0	47·8	41·0	33·7	20·0	7·0	- 12·6	- 22·0
Nova Scotia.													
Halifax	- 6·2	- 3·0	- 0·7	10·8	25·8	37·0	50·2	44·3	30·5	25·7	10·7	1·0	- 8·8
Sydney	- 6·3	- 5·3	- 4·3	11·7	25·0	32·3	38·3	41·4	33·6	21·7	10·7	- 5·1	- 9·8
PRINCE EDWARD ISLAND													
Charlottetown	- 15·0	- 15·7	- 2·0	14·7	27·7	30·0	41·0	45·1	30·4	32·2	13·7	- 8·7	- 10·5
MANITOBA.													
Winnipeg	- 35·0	- 33·2	- 20·3	1·0	25·4	38·1	41·2	40·4	26·1	8·1	- 29·8	- 31·2	- 33·0
BRITISH COLUMBIA													
Spence's Bridge	- 7·7	- 5·3	10·5	31·7	30·4	47·0	53·0	40·7	30·3	27·0	2·3	- 2·7	- 10·7

Monthly and Annual Rain-fall in Inches for various places in the Dominion of Canada from three or more years.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Toronto	1·23	0·80	1·02	2·44	3·25	2·98	3·25	3·02	3·72	2·39	2·08	1·05	20·42
Goderich	0·06	0·55	1·39	1·81	3·33	2·30	2·04	2·78	3·28	2·46	1·44	0·84	23·02
Woodstock	0·59	0·58	1·31	1·60	3·04	2·45	2·00	4·41	2·93	2·04	0·95	0·82	24·23
Peterborough	0·04	0·30	1·01	1·80	1·00	2·03	2·15	2·60	3·22	2·93	1·81	0·05	20·55
Pembroke	0·15	1·15	0·56	1·33	3·00	2·23	2·51	2·36	3·21	2·58	1·00	0·21	10·40
Montreal	0·05	0·42	1·11	1·30	2·26	3·01	2·20	3·62	3·75	2·69	0·85	27·26	
Quebec	0·25	0·09	0·42	1·17	2·52	1·11	2·52	4·27	2·81	2·89	0·95	0·00	10·26
St. John	2·13	2·86	2·23	3·14	4·51	3·00	3·43	3·80	4·33	4·08	5·33	2·67	33·27
Bass River	1·30	0·61	0·02	2·13	2·33	3·30	2·53	3·77	2·58	4·83	3·73	1·15	20·73
Halifax	3·66	3·39	2·01	3·10	4·17	3·04	2·37	3·01	3·09	5·02	4·03	3·44	43·03
Sydney	3·49	3·16	2·20	4·03	3·40	3·10	3·42	5·07	5·48	5·04	0·88	4·03	40·42
Charlottetown	2·27	0·68	1·12	0·07	2·41	3·70	2·02	3·48	3·04	4·02	2·46	1·00	20·75
Winnipeg	0·00	0·00	0·33	0·80	3·84	2·75	2·12	3·73	0·54	0·00	0·00	10·83	
Spence's Bridge	0·08	0·10	0·00	0·21	0·78	0·81	0·25	0·47	0·32	0·20	0·37	0·20	3·83

Average Fall of Snow in the several Provinces of the Dominion of Canada, with the number of Days' Snow, and number of Days' Rain.

	Depth of Snow in inches.										Total Snow in Season.	No. of Days' Snow.	No. of Days' Rain.
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.				
Ontario.....	2·2	13·5	20·1	25·1	14·9	19·9	2·2	S		95·9	58	89	
Quebec.....	2·0	13·9	23·2	31·8	16·4	17·5	8·8	1·4		115·0	60	94	
New Brunswick.....	1·3	10·1	31·9	19·2	19·0	15·3	10·2	0·8		108·4	53	107	
Nova Scotia.....	0·8	4·0	21·9	17·6	18·9	11·8	13·3	1·1		92·4	52	117	
Prince Edward Island	12·5	23·9	15·0	23·1	17·6	17·2	0·5			112·4	78	120	
Manitoba	3·1	4·8	11·6	8·9	7·4	13·4	9·7	3·6	0·0	62·5	59	62	
British Columbia .....	..	..	6·0	8·7	10·0	5·5	3·3	8	0·0	33·5	27	66	

TEMPERATURE, HUMIDITY, AND PRECIPITATION, AT MONTREAL, CANADA.

From the Record of the McGill College Observatory, — C. H. MCLEOD, Superintendent.

Nova.—The results for 1860 and 1861 are from observations made by Dr. Smallwood, at St. Martin, near Montreal; temperature in degrees Fahrenheit, inches in English measure. The figures in the means and sums row for rain-fall, &c., give the total rain-fall &c., per year, and the means (yearly) for the six years.

Table showing the number of days on which the mean temperature has been below Zero, 32°, 40°, &c.

To find the number of days on which the mean temperature was above any given temperature, subtract the number of days on which it was below that temperature from 365.—Thus, in 1877, the number of days on which it was above 60 was :—365—249=116.

Similarly to find the number of days on which the temperature was between (say) 60° and 70° in 1877 :—320—249=71.

YEAR.	AT AND BELOW ZERO.	AT AND BELOW 32°	AT AND BELOW 40°	AT AND BELOW 50°	AT AND BELOW 60°	AT AND BELOW 70°	AT AND BELOW 80°	AT AND BELOW 90°
1875	23	145	186	239	262	336	365	365
1876	11	118	181	228	275	317	362	366
1877	7	110	163	208	249	320	365	365
1878	5	95	156	190	253	330	362	365
1879	9	137	164	193	264	342	365	365
1880	12	130	173	206	252	307	366	366
Means ..	11	122	170	211	259	325	364	365

During the months November, December, January, February, and March, (in 1875-80)
The mean number of days on which the mean temperature was below zero was 11

"	"	"	"	"	32°	"	118
"	"	"	"	"	40°	"	146
"	"	"	"	"	50°	"	151

During the months April, May, and October—

The mean number of days on which the mean temperature was below zero was 0

"	"	"	-	"	32°	"	5
"	"	"	"	"	40°	"	25
"	"	"	"	"	50°	"	56
"	"	"	"	"	60°	"	79
"	"	"	"	"	70°	"	91
"	"	"	"	"	80°	"	92

During the months June, July, August, and September—

The mean number of days on which the mean temperature was below 40° was 0

"	"	"	"	"	50°	"	4
"	"	"	"	"	60°	"	28
"	"	"	"	"	70°	"	83
"	"	"	"	"	80°	"	121
"	"	"	"	"	90°	"	122

The mean temp. of the air during Nov. Dec. Jan. Feb. and Mar. (1875 to 1880) was 21.1°

" max.	"	"	"	"	"	"	59.5°
" min.	"	"	"	"	"	"	25.2°
" mean	"	"	April, May, and October,	"	"	"	47.4°
" max.	"	"	"	"	"	"	85.6°
" min.	"	"	"	"	"	"	8.5°
" mean	"	"	June, July, Aug. and Sept.	"	"	"	64.4°
" max.	"	"	"	"	"	"	92.2°
" min.	"	"	"	"	"	"	33.1°

Dates of Certain Periodic Events at Montreal and Toronto, during twenty-six years.

Year.	MONTREAL.					TORONTO.				
	First Snow.	First Frost.	Last Snow.	Ice left River	First Snow.	October	First Frost.	Last Frost.	Last Snow.	Ice left Bay.
1849	November 27	October 5	April 13	April 7	November 10	October 20	September	September	April 27	March 29
1850	" 17	" 14	" 14	" 9	" 10	" 25	"	"	" 20	April 3
1851	October 25	" 8	" 8	" 9	October	" 25	"	"	May 8	March 24
1852	" 17	" 2	September 17	" 16	" 19	November	" 11	"	" 20	April 17
1853	" 24	" 12	" 12	" 14	" 24	October	" 25	"	" 10	March 31
1854	" 15	" 11	" 30	" 25	" 25	"	"	"	April 29	April 8
1855	" 24	August 9	" 11	" 28	" 11	"	"	"	" 28	May 16
1856	November 1	" 26	May 31	" 24	" 24	"	"	"	" 22	" 19
1857	October 20	September 7	April 27	" 18	" 18	"	"	"	" 30	March 30
1858	November 4	August 25	" 22	" 9	" 9	"	"	"	" 21	" 10
1859	October 20	October 7	" 23	" 4	" 4	"	"	"	April 18	April 25
1860	September 29	May 3	" 20	" 10	September	" 25	"	"	" 6	June 4
1861	October 23	" 5	April 17	" 24	October	" 24	"	"	" 21	June 27
1862	November 10	August 24	May 7	" 23	" 23	"	"	"	" 22	March 15
1863	" 11	October 24	" 2	" 25	November	" 8	"	"	" 25	" 6
1864	October 8	September 26	April 18	" 13	October	" 8	"	"	August 30	February 28
1865	" 28	October 21	" 20	" 10	"	"	"	"	" 26	April 5
1866	" 4	September 16	May 3	" 19	September	" 17	"	"	" 26	March 14
1867	November 5	" 23	" 2	" 22	November	" 4	"	"	" 15	March 27
1868	October 17	October 24	April 23	" 17	October	" 16	"	"	" 11	May 2
1869	September 27	September 28	May 3	" 23	"	"	"	"	" 17	April 1
1870	October 29	" 6	April 5	" 18	November	" 10	"	"	" 31	April 1
1871	" 18	" 8	March 27	" 8	October	" 17	September	" 18	" 27	April 1
1872	" 11	October 12	April 24	" 15	"	"	"	"	" 15	March 13
1873	" 29	" 29	May 14	" 20	"	"	"	"	" 23	April 9
1874	" 31	" 13	" 2	" 13	"	"	"	"	" 15	March 25
					"	"	"	"	" 30	April 2
					"	"	"	"	" 26	March 18

III.—WILL FERTILITY OF SOIL BE LASTING?

II.—Do you think the comparatively inexpensive methods presently adopted by farmers in cultivating the lands in the North-West will continue to be effective for many years?—or will they be supplanted by more scientific farming, and the use of improved implements, phosphates, &c.?

PROBABLE CONTINUANCE OF FERTILITY.

The answer, in detail, to Inquiry No. I., affords sufficient evidence for the belief that, while the farmer with more or less capital, can fairly count upon an ample return for investments in improved agricultural implements and machinery,—the settler who has simply been able to effect the transportation of himself and family, and secure his homestead on surveyed lands, or effect his pre-emption farther away, may by persistent industry, soon attain to comfort, and be able to adopt improved methods. There would appear, from reliable accounts, to be but little likelihood of the virgin-soil being exhausted, or even seriously deteriorated, during the first generation of settlers. An instance has been reported where *a field has yielded wheat for fifty consecutive years, without the use of manure.*

It would seem, therefore, that all who have courage and vigor enough to carry them to their destined homes are not likely to be vexed about the wearing out of the soil. Other transient obstacles may, however, cause inconvenience for a little; for instance, lack of roads into the heart of the country, and distance from markets. But as settlement progresses roads will be made, and a considerable difficulty obviated; the prospect is, also, that railways from Winnipeg—the capital of Manitoba, and for the present the starting-point for the interior—will soon radiate in all directions, and bring new settlements into easy communication with important centres.

IV.—STOCK-RAISING AND DAIRY FARMING.

- III.—1. What are the prospects for Stock-Raising, as a distinct branch of agricultural enterprise in the Dominion?—and what are the resources upon which the future export trade in Cattle may legitimately hope to draw?
2. Are there any lands, in the older Provinces of the Dominion, adapted for Stock-Raising and Dairy-Farming?
3. Are the climatic conditions more favorable in any one Province than another of the Dominion for Stock-Raising?
-

STOCK-RAISING IN THE NORTH-WEST.

As will be seen by referring to paragraphs on p. 19 about prairie-grass and hay, and the wintering of cattle, the country is exceedingly well adapted for stock-raising. A subjoined statement affords undoubted evidence, as to how thoroughly this is understood, in the arrangements made, and in progress for the establishment of extensive cattle-ranches on the Third Prairie Plateau, where there is an immense area of pasture-land specially adapted for the herding of great droves. So nutritious is the prairie-grass, that cattle driven for hundreds of miles across the plains improve steadily in weight and condition as they proceed onward.

There cannot be any doubt that the raising of horses, cattle, and sheep, will be a great branch of farming industry in the North-West.

In this department of enterprise, the "Cochrane Ranche Company" may with great propriety be called the pioneer company of Canada. Two or three projects of a similar nature are spoken of, but so far actual operations in the Territory have not been commenced. There are, however, some small ranches belonging to private individuals, which promise fairly, considering the scale on which they have been begun. The capital of the Cochrane Company is \$500,000, and is all subscribed. The ranche is situated in the Bow River district of the Third Plateau, in the vicinity, so to speak, of the Rocky Mountains, and embraces over 100,000 acres of land. It is already stocked with about 10,000 head of cattle—including 50 pure-bred bulls imported from England, and 50 more will arrive in Canada during the present month (October). Arrangements are also made for the breeding of horses—a large number of mares and two thorough-bred stallions having been sent to the ranche. The Company also intends to raise sheep of the best breeds.

Referring to remarks on pages 19 and 20, it has been considered important to mention these particulars, to show how much confidence is felt by the best-informed parties about the suitableness of regions in the North-West for stock-raising purposes. This will be all the more striking when it is remembered, that

the Company is importing the finest English stock, and sending it into a region where all their cattle will winter in the open country.

As regards routes to the interior, given on pages 42 and 43, the Bow River region can be reached by railway from Winnipeg, to Glyndon on the Northern Pacific Railway—thence west by rail to Bismarck, on the Missouri River—thence by steamboat to Fort Benton—taking the road from that point north-westerly to Fort Calgarry. This is a long, round-about way; but there is expected to be *direct* railway communication between Winnipeg and Fort Calgarry before the end of next year (1882), via Canada Pacific Railway.

CATTLE-RAISING AND DAIRY-FARMING IN THE OLDER PROVINCES.

The export trade in cattle from Canada is comparatively new. Commencing about eight years ago, the farmers in the older Provinces soon found a larger and better market in Great Britain for their beef-cattle, the demand amply warranting increased production, until now, that the business is profitable and expanding every year. An examination of the table on p. 34 will show how greatly the exportation (principally to Great Britain,) has increased within five years; and it may be fairly inferred that its future development will be as remarkable as its past growth has been. Present sources of supply are Ontario, Quebec, New Brunswick, and, as yet very partially, Prince-Edward Island,—the larger proportion hitherto coming from Ontario. The agricultural regions of these Provinces are well adapted for stock-raising of all kinds,—this being specially true of the “*Eastern Townships*” of Quebec. A large percentage of the land in these Provinces produces plenty of all kinds of roots and coarse grains, so necessary for Winter-feeding;—the Summer grazing being also excellent. If the weather in Winter renders suitable stable and shed accommodation more necessary than in the North-West, there is this advantage in favor of the stock-raiser near the shipping ports,—he has not to incur the risk of deterioration that must necessarily be encountered on long distances of transportation by railway.

There is a steadily increasing demand for horses in Canada for the United States, as stated on page 35.

Dairy-farming is now a most important branch of agricultural industry in Quebec and Ontario,—but most extensively in the latter Province. By adopting improved methods of production, the brands of the best Canadian Cheese-factories and Butter-creameries, rank most deservedly high, and command extreme prices. The table of exports on p. 34 will show the volume of the trade during five years; while another statement on p. 37 indicates the immense increase in shipments of Butter and Cheese from the Port of Montreal during a period of eleven years.

The shipment of Eggs, principally to the United States, is an increasing and profitable business.

An examination of the values, in detail, as given in the table on p. 34, will show in what articles increases or decreases have occurred.

For example,—the *average* annual grand total of value for the five years was \$71,752,006, while the *actual* grand total for 1879–80 shows an increase of 16·15 per cent. The *average* annual value of foreign products exported during the five years, was \$9,421,336, while the actual total for 1879–80 shows an increase of 41 per cent.

It will be noticed from the items in the "Products of the Forest," that there was a marked decrease in the value of square timber shipped during 1878–79. The falling-off did not arise from a scarcity of that article—but was occasioned by great depression in the foreign market. Large stocks were held over in Canada to await the return of prosperous times—which, it is believed, the statement for the fiscal year ended on 30th June last, and for the current twelve months, will show to have been experienced.

The figures in detail which relate to the export of Canadian "Animals and their Products," indicate that high annual averages are maintained. Within the past few years the shipment of Cattle and Sheep to Europe (mainly to Great Britain,) has become immense; and there is also a large demand for horses, chiefly at the instance of buyers from the United States,—very considerable shipments being made by railway to the New England States,—also to New York, New Jersey, and Pennsylvania. The values of Cheese, Butter and Eggs exported cannot fail to attract the attention of Dairy-Farmers in Europe; while the values of the various kinds of cereals, represent large exportations, and indubitably show what an outlet there is for surplus productions of every kind.

OPINION ABOUT THE FUTURE EXPORT TRADE.

An opinion about the increase of Canadian Trade in the future is given with a good deal of diffidence. The Respondent reasons in this way. The progress of the City of Montreal may be looked upon as representative in its character. During the past thirty or forty years, that progress has been concurrent with the settlement and developement of the resources of the country. Coincident with the flow of population into the North-West, and the completion of communications that lead in that direction, it may be asked, is it unreasonable to imagine that the agricultural enterprise of all kinds which will be entered upon in the vast, rich prairie-land, will directly tend to an immense increase of exportable productions?

The following illustrations of the progress of commerce in Montreal are noteworthy,—the comparisons being for dates with an interval of thirty years:—

YEARS.	Sea-going Vessels in Port.	Total Tonnage.	Value of Merchandise Exported.	Value of Merchandise Imported.
1850	211	46,156	\$ 1,744,772	\$ 7,174,780
1880	710	628,271	30,224,904	37,103,869

The figures concerning vessels and tonnage are for seasons of navigation in the respective years,—the statements regarding Exports and Imports are for fiscal years. The average capacity of the vessels in 1850 was about 220 tons,—the greatest was probably 400 tons, or thereabout. The average capacity of the vessels in 1880 was about 900 tons,—the greatest was over 4,000 tons. The number of vessels in 1880 included 354 steamships, their aggregate tonnage being ten times greater than that of all the vessels in 1850. The aggregate value of imports and exports at Montreal during the fiscal year 1879–80 was \$67,328,775,—or about 43 per cent. of the entire merchandise imported into Canada;—the value of exports being 34 per cent. of total exports.

The progress of the Grain and Flour Trade of Montreal is represented in the following table:—

	1850.		1880.	
	Receipts.	Shipments.	Receipts.	Shipments.
Wheat, bushels.....	845,277	71,359	9,637,124	9,084,266
Indian Corn, bushels	51,965	5,719	7,772,549	7,622,161
Peas, "	21,256	98,006	2,617,656	3,081,674
Oats, "	3,677	1,061	1,191,531	1,853,829
Barley, "	512	350	357,176	293,023
Rye, " .....	....	....	443,528	452,847
Flour, barrels,.....	483,603	182,988	735,596	739,007

The comparative aggregates of the trade in these two years (receipts and shipments added together), were, in round numbers, fifty-one millions and three quarters of bushels in 1880, against four-and-a-half millions in 1850.

There are no figures at hand to show the shipments (if any) of Butter and Cheese from Montreal in 1850. Some idea may be formed of the increase in the

trade in these articles, by comparing the following figures relating to the years 1870 and 1880:—

Shipments in 1870.

Butter,	7,763,976 lbs.....	value \$1,507,591
Cheese,.....	5,683,883 "	" 801,170

Shipments in 1880.

Butter,	13,983,840 lbs.....	value \$2,882,360
Cheese,.....	34,776,180 "	" 3,095,220

These statements show remarkable results. For instance, the quantity of Butter shipped in 1880 exceeded that of 1870 by 6,219,864 lbs., or 80·12 per cent.; the increase in shipments of Cheese, being 29,142,297 lbs., or 514 per cent. The aggregate value of Butter and Cheese shipped in 1870, was \$2,308,761, against \$6,877,580 in 1880,—the increase in the latter year over the former being \$4,568,819, or 197·89 per cent.

Railway and Lake connections between the seaboard and the North-West, all trend directly or indirectly towards Montreal, at the head of ocean navigation,—see “Inland Communications,” on pp. 41, 42, 43. If, then, the foreign trade of Canada increased so much in course of the past generation, with a comparatively small and sparsely located population,—the Respondent feels warranted in entertaining a firm belief that *the developement of the next ten or twenty years will probably be in a geometrical ratio.*



VI.—THE CANADIAN HIGHWAY BETWEEN EUROPE AND THE ORIENT.

VII.—What will the probable effect of the building and completion of the Canada Pacific Railway be upon the trade, home and foreign, of the Dominion?

VIII.—Whether do you think the settlement of the North-West Territory by a numerous population, will increase or lessen the volume of Canadian export trade,—especially in cereals,—to countries in Europe?



THE CANADA PACIFIC AND OTHER RAILWAY LINES AS FACTORS IN COMMERCE AND SETTLEMENT.

A satisfactory answer to much that is involved in the above inquiries, will be found in the accompanying Map (B.). As will be noticed, it was prepared a few years ago, by Thomas Keefer, Esq., C. E., specially for the “Annual Report

of the Trade and Commerce of Montreal"; and, to facilitate reference, the following statements are submitted.

It is shown that the distance from Quebec to Liverpool is 475 miles less than from New York to Liverpool. Kingston, at the foot of Lake Ontario, is 125 miles nearer Liverpool than is New York. The distance from Hamilton, at the head of Lake Ontario, is the same as from New York to Glasgow. Lakes Ontario, Erie, and the southern point of Huron are nearly in a straight line with the Ports of Great Britain, through the Straits of Belle-Isle. An examination of the table on p. 44 will show how this saving of mileage applies to German and French ports.

The Map also shows what are the geographical relations between the South-Western and Western States and the Dominion,—indicating that the shortest line that may be drawn from New Orleans to Liverpool touches the Province of Quebec, passing through Miramichi in New Brunswick. A straight line from Cincinnati to Liverpool passes northward of Montreal and the city of Quebec. The shortest route from St. Louis to Liverpool would pass far to the north of this city; and an air-line from San Francisco to Montreal passes through Sault Ste. Marie. It would, therefore, seem that all that part of North America west of St. Louis, should find the shortest and otherwise most available route for exporting to, or importing from, Europe, to be that which is afforded by the River St. Lawrence.

While the Map includes a profile of the line of water communication from the head of Lake Superior to the seaboard, it also indicates the route of the Canada Pacific Railway,—besides the shorter sea distances on the Atlantic and Pacific. For example, take the following comparison of distances to Japan and China:—

<i>Canadian Route.</i>	<i>United States Route.</i>
Miles.	Miles.
Liverpool to Montreal, via Belle-Isle 2,790	Liverpool to New York..... 3,040
Montreal to Port Moody, C. P. R.R.. 2,870	New York to San Francisco..... 3,370
Port Moody to Victoria, B. C..... 90	San Francisco to Yokohama..... 4,470
Victoria to Yokohama..... 4,108	Yokohama to Shanghai..... 1,045
Yokohama to Shanghai..... 1,045	—
—	Total..... 11,925
Total..... 10,903	
Difference in favor of Canadian route. 1,022	
—	
11,925	

The route from Southampton *via* the Suez Canal is also longer than the proposed Canadian line, the distances being—Southampton to Shanghai, China,

10,359 miles, or to Yokohama, Japan, 11,119 miles;—the Canadian route to the latter port, as shown above, being only 9,858 miles. A comparison of distances to Sidney, Australia, is also considerably in favour of communication with the Australian Colonies via Canada.

It will be noticed that the Lake Superior terminus of the Canada Pacific Railway is nearer, by water carriage, to Montreal and New York than is Chicago. And another most important point is, that Sault Ste. Marie is the shortest outlet to tide-water for Minnesota and places west to Salt Lake and San Francisco. The deeper green tint, covering a portion of the United States, shows at a glance the very large region of country that would be tributary to the great air-line routes traced to Montreal, and through Canada to Great Britain and the European Continent.

But, apart altogether from the advantages of a most favorable inlet from Europe to the North-Western States, from the extension of the Canadian railway system to Sault Ste. Marie, the benefit to Manitoba and the New Territories of the Dominion will be immense. This may be somewhat appreciated by reflecting on the single statement that, when the railway from Winnipeg to Prince Arthur's Landing is finished, and the connecting line from Lake Nipissing completed to the St. Marie River, passengers from Montreal to Winnipeg will be able to make the journey in less, probably, than sixty hours. Another result of the completion of railway communication with Sault Ste. Marie will be, that business men will realize that the distance from Montreal to Lake Nipissing is practically the same as from Montreal to Toronto,—the small difference (9 miles) being inappreciable on such a distance. From Montreal to Sault Ste. Marie may be said to be the same as from Montreal to Detroit—the difference being only 8 miles. The distance from Montreal to Chicago is 836 miles,—from Montreal to Prince Arthur's Landing is but 842 miles, showing a small difference of six miles; while the route from Montreal to Winnipeg is but a few (22) miles longer than the railway mileage between Montreal and St. Paul, Min.

It is worthy of notice here, that the export trade in Wheat from Oregon—cargo being taken on board ship at Portland, about 110 miles up the Columbia River, while sometimes part of it is lightered to Astoria,—finds a good deal of its supply in the interior State of Montana, and even, it is said, in Dakota. The grain is put into sacks, and conveyed by water, in barges, a distance of 350 miles or more,—there being at present two portages (each of about five miles, traversed by rail,) within that distance, the transportation charges to Portland amounting to 33c. to 35c. per bushel. The rate of ocean freight from Portland to Liverpool varies, say, from 2s. 6d. to 4s. sterling per cental, insurance costing 1 $\frac{3}{4}$ to 2 per cent., a good trip by sailing vessel occupying five months. It does not seem improbable, therefore, that when all the railway connections between Montreal and Sault Ste. Marie are completed, the Canadian freight and passenger traffic

will be immensely augmented from Montana, Dakota, and Minnesota,—the surplus products of these States finding a better, because quicker and cheaper, transit to the Canadian inland ocean port, and a nearer outlet there to European countries, than at any United States port on the Atlantic sea-board.

In view of the foregoing statements, and all that has been advanced in answer to Inquiries Nos. I., IV., and V., it may be safely affirmed,—1. That the completion of the Canada Pacific Railway will exert a powerful influence for good upon the home and foreign trade of the Dominion;—and, 2. That the settlement of the Canadian North-West by a numerous, thrifty and industrious population, will greatly tend to increase the volume of Canadian export trade,—especially in cereals, dairy produce, and cattle,—to the nations of Europe.



VII.—PRESENT AND FUTURE MEANS OF INTERNAL COMMUNICATION.

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- IX.—1. What are the present and prospective means of Internal Communication between the Atlantic sea-board and the interior, for the transportation of passengers and merchandise?
2. Are the rates of inland transportation in favor of the Canadian as against the United States routes to the Interior?
-

PRESENT CONVENIENT ACCESS TO THE INTERIOR.

An examination of the following routes from the seaboard, and from Montreal at the head of ocean steamship navigation on the River St. Lawrence, to the North-Western States, and especially to the immense tracts of agricultural land in the Canadian North-West, as indicated on the accompanying Skeleton Map (C)—will show that they afford at present, and are likely to do so for years to come, the safest, cheapest, and most convenient lines of transportation for passengers and merchandise. They will also afford complete immunity from the vexatious importunities, and expensive deceptions practised upon travellers *en route* to places in the United States,—especially upon strangers from foreign countries. There is an all-rail route from Montreal, through a portion of the United States to Winnipeg in Manitoba; but there are now three Canadian routes (partly by rail, and partly by water) to the head of Lake Superior. One is by railway to Goderich,

and thence by steamer; another is by railway to Owen Sound; a third is by railway to Collingwood; while there will by-and-by be a fourth via Midland City at the south-east end of Georgian Bay.

The Canada Pacific Railway Company has commenced to push forward its line to the point where St. Marie River is to be crossed for connection with the Northern Pacific, and other Railways in the United States. It may reasonably be supposed, that there will be no delay in building connecting links on the other project to Sault St. Marie. When both these enterprises are accomplished, travellers and merchandise to and from the West and North-West will have a choice of favorable routes.

It would be a very easy matter now, to make satisfactory arrangements with steamship owners on the Continent of Europe for conveying passengers of all classes via ports on the River St. Lawrence, to Manitoba and the North-West Territory of Canada. It is also evident that the route through the Dominion commends itself to passengers desirous of going to the Western and North Western States of the neighboring Republic—it being shorter and more comfortable than routes via sea-ports of the United States. It can hardly be doubted that as soon as direct steamship communications are established between Canada and ports in Germany, France, &c., a great deal of the traffic which now goes by way of Boston, New York, &c., will be diverted to the St. Lawrence route, and enlarge the business relations between merchants on the European continent and in Canada.

INLAND COMMUNICATIONS.

Montreal, the ocean port of Canada during seven months of the year, is situated 180 miles farther inland than Quebec, and about 1,000 miles from the ocean. It affords to travellers and merchants great facilities for saving distance, time, expense, &c., the communications with the interior being of the amplest kind.

I. There is (1) the water route to the West and the North-West by the River St. Lawrence, the Canals, and the Great Lakes; (2) the direct railway routes to all parts of Canada and the Western States, the trunk lines being the Great Western and the Grand Trunk Companies,—the latter having its own through line from Portland, Me., to Montreal, and thence to Chicago, a distance of 1,133 miles,—the connecting and branch lines reaching to every place of any importance; and (3) present and intended routes by railway and water to all points.

1. The journey by the Great Water Highway of the Dominion, by first-class passenger and freight propellers, is as follows:

Montreal to Chicago, Ill.,	1,121 Miles.
" to Fort William, Man.,	1,100 "
" to Duluth, Minn.,	1,294 "

2. The all-rail journey from Montreal westward, to make connections in the West and South-Western States, is as follows:—

Montreal to Chicago, by Grand Trunk Railway... 836 Miles.
 " " by Grand Trunk and Great
 Western Railways. 845 "

The present all-rail journey from Montreal by Grand Trunk Railway to St. Boniface, via Chicago and St. Paul, is as follows:—

Montreal to Chicago,.....	836 Miles.
Chicago to St. Paul,.....	410 "
St. Paul to St. Vincent,.....	389 "
St. Vincent to St. Boniface.....	67 "
	— 1,702
New York to St. Boniface, via Chicago and St. Paul,.....	1,846
Boston to St. Boniface, via Chicago and St. Paul,.....	1,906

3. There are several routes by railway and water, all of which, though differing somewhat in length, nevertheless save large distances, as compared with the all-water route,—and besides, merchandise transported avoids the tolls levied on the Canals. The comparative distances are as follows:—

a.	Montreal by Grand Trunk Railway to Toronto . . .	333	Miles.
	Toronto to Collingwood, by Northern Railway . . .	94	"
	Collingwood to Chicago, by propellor	600	"
			<u>1,027</u>
b.	Montreal, by rail, to Collingwood, (as above) . . .	427	Miles.
	Collingwood to Fort William, by propellor	544	"
			<u>971</u>
c.	Montreal, by Grand Trunk Railway, to Toronto . . .	333	Miles.
	Toronto to Owen Sound, by Toronto, Grey and Bruce Railway	122	"
	Owen Sound to Chicago, by propellor	585	"
			<u>1,040</u>
d.	Montreal to Owen Sound, as above	455	Miles.
	Owen Sound to Fort William, by propellor	525	"
			<u>980</u>

e.	Montreal, by Grand Trunk Railway, to Belleville,	220 Miles.
	Belleville to Midland City on Georgian Bay	160 "
	Midland City by propellor to Chicago.....	600 "
		— 980
f.	Montreal to Midland City, as above.....	380 Miles.
	Midland City, by propellor, to Fort William.....	545 "
		— 925
g.	Montreal, by Grand Trunk Railway, to Goderich.,	466 Miles.
	Goderich, by propellor, to Chicago.....	600 "
		— 1,066
h.	Montreal, by Grand Trunk Railway, to Goderich..	466 Miles.
	Goderich, by propellor, to Fort William.	540 "
		— 1,006

II. When certain intermediate links are completed, the all-rail distances and connections with the Canadian North-West and the North-Western States will be principally as follows:—

1. Via Canada Pacific Railway, north of Lake Superior,—

Montreal to Ottawa, by Q. M. O. & O. Ry.,.....	119 Miles.
Ottawa to Calendar, by Can. Pacific Extension....	230 "
Calendar to Fort William, say.....	675 "
Fort William to St. Boniface,.....	426 "
	— 1,450

2. By Canada Pacific Railway, via Sault Ste. Marie,—

Montreal to Calendar, as above,.....	349 Miles.
Calendar to Sault Ste. Marie,.....	300 "
Sault Ste. Marie to Duluth,.....	400 "
Duluth to Glyndon,.....	244 "
Glyndon to St. Boniface,.....	223 "
	— 1,516

3. By Grand Trunk Railway, via Belleville, Peterborough, Gravenhurst, and Sault Ste. Marie,—

Montreal to Belleville,.....	220 Miles.
Belleville to Peterborough,.....	60 "
Peterborough to Gravenhurst,	93 "
Gravenhurst to Sault Ste. Marie,.....	300 "
Sault Ste. Marie to Duluth,.....	400 "
Duluth to Glyndon,.....	244 "
Glyndon to St. Vincent,.....	156 "
St. Vincent to St. Boniface,.....	67 "
	— 1,540

**SHORTEST DISTANCES FROM PORTS ON CONTINENT
OF EUROPE.**

(IN NAUTICAL MILES.)

With two exceptions, the distances in this table are measured through the English Channel. An asterisk () indicates the course to be round the North of Scotland. All the routes to Montreal are calculated via the Straits of Belle Isle. The information has been kindly furnished by E. Deville, Esq., Deputy Surveyor-General, Ottawa.*

FROM.	TO MONTREAL.	TO NEW YORK.	DIFFERENCE IN FAVOR OF MONTREAL.
Havre.....	2,945	3,130	185
Antwerp	3,130	3,320	190
Rotterdam.....	3,140	3,330	190
Hamburg.....	{ 3,410 *3,200	{ 3,600 3,510	{ 190 310
Christiania.....	*3,158	3,465	307
Bergen.....	2,920	3,240	320
Trondheim.....	2,970	3,330	360
South-West End of Scilly Islands	2,690	2,880	190
North End of Orkney Islands....	2,660	2,970	310

The figures in the last column of this table show important differences in the length of ocean voyages in favor of Montreal.

The distance from Liverpool to Winnipeg, via the River St. Lawrence, and by the route from Montreal, is shorter than that via New York, by 580 miles.

From Antwerp, Rotterdam, or Hamburg, the Canadian route is shorter than that via New York, by 520 miles.

CANADA'S WINTER PORTS.

Although the River St. Lawrence is closed by ice for about five months in the year, the trade of Canada does not come to a stand-still; the importation of merchandise and the exportation of produce go on,—goods being rapidly transported by railway to all parts of the country. Halifax, N. S., is designated

the Winter-port of the Dominion, the distance from Montreal by Grand Trunk and Intercolonial Railways being 85½ miles. All the requisites for a large terminus on the seaboard are to be provided, so as to facilitate the exportation of grain and other produce. At present, however, a very large proportion of the Winter trade, is done via Portland, Maine. Transportation to and from that port is effected by the Grand Trunk Railway, the distance from Montreal being only 297 miles.

It is expected that, ere long, there will be another outlet on the Canadian seaboard in Winter, by the port of St. John, N. B.,—the distance by railway from Montreal, being about 450 miles. The railways in the Province of New-Brunswick, the State of Maine, and the Province of Quebec, which will be associated to form the route from St. John, will, it is proposed, effect a connection with the railway system leading westward and up into the North-West, by building a bridge across the River St. Lawrence at a short distance above Montreal. The latter City will thus be afforded additional facilities both for Winter and Summer connection with the seaboard.

VIII.—FACILITIES FOR SAFE NAVIGATION OF THE GULF AND RIVER ST. LAWRENCE.

X.—What are the chief difficulties encountered in the navigation of the Gulf and River St. Lawrence?

EXTENSION OF THE TELEGRAPH SYSTEM.

The difficulties which have attended the navigation of a long coast-line, especially where islands lie near the entrance to the Gulf, as well as in the path of steamships entering by the Straits of Belle-Isle, may now be considered to be obviated. The plan for extending the telegraph system to the River and Gulf is completed. A coast-line of telegraph has been erected between Halifax and Canso, with twenty intermediate stations; telegraphic connections have also been established on a number of islands along that coast, near which thousands of sea-going, coasting, and fishing vessels pass every year, the masters of which now have the advantage of communicating by semaphores with the stations on shore. Many of the light-houses on the south shore of the River St. Lawrence have been placed in telegraphic connection with the shore-lines; and signal stations, to work

in accord with the International Code, have been established at the following light-houses: Father Point, Little Metis, Matane, Cape de Chatte, Cape Magdalene, Cape Rosier, Cape Ray, and at the village of L'Islet. These were the first electro-signal stations established on the coasts of Canada,—the International system, with which they are in unison, being capable of indicating 78,642 distinct signals.

Submarine cables have been laid from the mainland to the islands of Anticosti, Magdalen, Bird Rocks, and St. Paul; and in addition, signal guns are established at various points, a 32 pounder having been placed at Heath Point, on the south-east end of Anticosti, and one of similar calibre at Bird Rocks.

The accompanying Telegraphic Chart (marked D) shows the telegraphic lines, semaphore stations, and light-houses,—the latter being diversely marked with perpendicular, oblique, and horizontal bars of different colors to assist mariners to find their position in the day-time. Provision is also made for distinguishing the several lights by night, by varying the forms and colors, and by different combinations. The annexed table of night-designations for the light-houses from Gaspé to Father Point will afford a useful illustration of what the differences are.

*Night Designation of Light-Houses on the South Shore of the St. Lawrence
as per Official List issued by Department of Marine, 1880.*

ABBREVIATIONS:—F. means Fixed ;—Alt., Alternate ;—Rev., Revolving.

NAME OF LIGHT.	LATITUDE N.	LONGITUDE W.	NUMBER OF LIGHTS.	DESCRIPT'N OF LIGHT	COLOR.	INTERVAL OF REVOLUTION OR FLASH.
Gaspé Cape.....	48° 45' 15"	64° 9' 15"	One	F.	Red	Every $\frac{1}{2}$ Min.
Cape Rosier.....	48 51 57	64 12 0	One	F.	White	" "
Fame Point.....			One	F.	White	Every Minute.
Cape Magdalene.	49 15 40	69 19 30	One	Alt. { Red and White	} Every 2 Mins.	
Martin River ...	49 13 25	66 9 0	One	F.	White	" "
Seven Islands...	50 5 40	66 22 44	One	F.	White	" "
Cape Chatte	49 5 55	66 45 29	One	Rev.	White	Every 30 Secs.
Matane.....	48 52 0	67 33 0	One	F.	White	" "
Little Metis Pt..	48 41 10	68 2 30	One	Alt. { Red and White	} Every Minute.	
Father Point...	48 31 25	68 27 40	One	F.	White	" "

The extension of the telegraph system to the islands in the Gulf of St. Lawrence is the project of the Hon. P. Fortin, M.P., under whose supervision it is being carried forward to completion. In a letter of his, recently published, it is stated that a red buoy has been placed off Heath Point (Anticosti), in seven fathoms of water, to enable the mail steamers to touch there and send forward the latest news in advance. In this way a day will be gained on Father Point. This buoy is understood to have been located at the suggestion of Sir Hugh Allan.

Mr. Fortin further states that, when the north shore telegraph line shall have been completed to Point Amour, the east point of the Bay of Forteau, at the narrowest part of the Straits of Belle Isle, it will be practicable to land despatches, private messages, lists of passengers, &c., from the in-coming mail steamers *within five days' time from Mouille*. This achievement will establish the great superiority of the St. Lawrence route for all purposes, as contrasted with the much longer voyages via United States ports.

